

Table 4.11a
Water Quality Criteria for Dissolved Metals (at Critical Receiving Water Condition)

	Dissolved Metal Concentration, ug/L				
		Cadmium	Copper	Lead	Zinc
WA WQ Stds (Present Criteria)	Acute	1.58	6.10	16.40	49.90
	Chronic	1.14	4.46	0.64	41.60
EPA Revised Stds (Future Criteria) Applies only to cadmium	Acute	0.83			
	Chronic	0.13			

Table 4.11b
Summary of Total Metals Composite Removal Efficiencies
for AKART Alternative 4 Under Different Maintenance Options

Sweeping Frequency	Total Metal Composite Removal Efficiency (%) ^a				
	Cadmium (present criteria)	Cadmium (future criteria)	Copper	Lead	Zinc
Annual CB Cleaning + Monthly Sweeping	67	67	60	67	58
Annual CB Cleaning + Bi-Monthly Sweeping	71	71	65	71	63
Annual CB Cleaning + Weekly Sweeping	75	75	71	75	69
Bi-Annual CB Cleaning + Monthly Sweeping	87	87	84	87	83
Bi-Annual CB Cleaning + Bi-Monthly Sweeping	88	88	86	88	85
Bi-Annual CB Cleaning + Weekly Sweeping	90	90	88	90	87

Table 4.11c

Effluent Pollutant Concentrations for Total Metals at Select Locations Using AKART Alternative 4 Maintenance Options

Location of Pollutant Concentration	AKART Alternative 4 Maintenance Options	Total Metal Concentration, ug/L				
		Cadmium (present criteria)	Cadmium (future criteria)	Copper	Lead	Zinc
Stormwater Runoff ^a	Untreated	5.0	5.0	22.3	21.9	129.8
At Discharge Pipe to Spill Control Lagoon	Annual CB Cleaning + Monthly Sweeping	1.7	1.7	8.9	7.2	54.5
	Annual CB Cleaning + Bi-Monthly Sweeping	1.5	1.5	7.8	6.4	48.0
	Annual CB Cleaning + Weekly Sweeping	1.3	1.3	6.5	5.5	40.2
	Bi-Annual CB Cleaning + Monthly Sweeping	0.7	0.7	3.6	2.8	22.1
	Bi-Annual CB Cleaning + Bi-Monthly Sweeping	0.6	0.6	3.1	2.6	19.5
	Bi-Annual CB Cleaning + Weekly Sweeping	0.5	0.5	2.7	2.2	16.9
In Spill Control Lagoon (at end of WQ Treatment Storm event)	Annual CB Cleaning + Monthly Sweeping	0.1	0.14	0.74	0.60	4.54
	Annual CB Cleaning + Bi-Monthly Sweeping	0.1	0.12	0.65	0.53	4.00
	Annual CB Cleaning + Weekly Sweeping	0.1	0.10	0.54	0.46	3.35
	Bi-Annual CB Cleaning + Monthly Sweeping	0.1	0.05	0.30	0.24	1.84
	Bi-Annual CB Cleaning + Bi-Monthly Sweeping	0.1	0.05	0.26	0.22	1.62
	Bi-Annual CB Cleaning + Weekly Sweeping	0.0	0.04	0.22	0.18	1.41
At 10-ft Mixing Zone Boundary ^b (located 10 ft beyond lagoon boundary)	Annual CB Cleaning + Monthly Sweeping	0.1	0.06	0.31	0.25	1.88
	Annual CB Cleaning + Bi-Monthly Sweeping	0.1	0.05	0.27	0.22	1.66
	Annual CB Cleaning + Weekly Sweeping	0.04	0.04	0.22	0.19	1.39
	Bi-Annual CB Cleaning + Monthly Sweeping	0.02	0.02	0.12	0.10	0.76
	Bi-Annual CB Cleaning + Bi-Monthly Sweeping	0.02	0.02	0.11	0.09	0.67
	Bi-Annual CB Cleaning + Weekly Sweeping	0.02	0.02	0.09	0.08	0.58
At 100-ft Mixing Zone Boundary ^b (located 100 ft beyond lagoon boundary)	Annual CB Cleaning + Monthly Sweeping	0.01	0.01	0.08	0.06	0.47
	Annual CB Cleaning + Bi-Monthly Sweeping	0.01	0.01	0.07	0.05	0.41
	Annual CB Cleaning + Weekly Sweeping	0.01	0.01	0.06	0.05	0.34
	Bi-Annual CB Cleaning + Monthly Sweeping	0.01	0.01	0.03	0.02	0.19
	Bi-Annual CB Cleaning + Bi-Monthly Sweeping	0.01	0.01	0.03	0.02	0.17
	Bi-Annual CB Cleaning + Weekly Sweeping	0.00	0.00	0.02	0.02	0.14

Coding

Does not meet Acute Water Quality Criteria (dissolved metals)

X.X

Does not meet Chronic Water Quality Criteria (dissolved metals)

X.X

Notes

Alternative 4: High Efficiency Sweeping + Modified Catch Basin/Cleaning

^a Sutherland, R.C., S.L. Jelen, and G. Minton. 1998. High Efficiency Sweeping as an Alternative to the Use of Wet Vaults for Stormwater Treatment. Advances in Modeling the Management of Stormwater Impacts - Vol 6. W. James, Ed. Pub. By CHI, Guelph, Canada 1998. ISBN 0-9697422-8-2. pp. 369-370.

^b Dilution assumes 6-lane bridge alternative conditions during WQ Treatment Storm Event where all stormwater is conveyed to spill lagoon. Dilution factor of 12 in the spill control lagoon, 29 at the acute zone boundary, and 117 at the mixing zone boundary.